

Peer Review

Review of: "Undefinable True Target Learning: Towards Learning with Democratic Supervision"

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This article challenges the foundational machine learning assumption that a "True Target" (TT) objectively exists in the real world, explicitly positing a radical "non-existence" assumption instead. Based on this premise, the author establishes the Undefinable True Target Learning (UTTL) framework, which formalizes a pathway toward Learning with Democratic Supervision (LDS) by integrating the expertise of both domain and machine learning experts in the data preparation and learning processes.

Merits

1. The UTTL framework is highly formalized and systematically developed, utilizing a cohesive set of definitions and theorems to bridge abstract philosophical stances with practical mathematical structures for multiple inaccurate target learning.
2. The manuscript features an exceptionally thorough systematic review and taxonomy of TT assumptions across current ML paradigms, which serves as a strong academic foundation to justify the necessity of the proposed non-existence assumption.

Areas for Improvement

1. The author emphasizes the philosophical distinction between the "non-existence" and "may-not-exist" assumptions of the True Target (TT). However, in the technical implementation, the author should more explicitly articulate how this radical shift brings essential computational gains or unique optimization behaviors that fundamentally differ from those found in traditional LMA or WSL approaches.
2. The term "reasonable operations" used in Theorem 3 and Formula (3) to fuse domain and machine learning expert targets requires a more precise technical definition. The author should specify the necessary logical or statistical properties that these operators must satisfy.

In conclusion, this manuscript represents a highly intellectually ambitious contribution that addresses the overlooked ontological foundations of machine learning. The work is both philosophically insightful and technically structured, offering a promising new direction for handling tasks with inherent ambiguity. However, certain formal specifications and practical guidelines regarding the weighting and fusion mechanisms need to be refined to ensure the framework's reproducibility. I recommend the manuscript for publication subject to these minor but essential revisions.

Declarations

Potential competing interests: No potential competing interests to declare.